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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/557,820	11/23/2005	Kwan Young Han	P2614US00	2544

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EXAMINER
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TRAN, TONY

ART UNIT	PAPER NUMBER
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2894

NOTIFICATION DATE	DELIVERY MODE
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05/18/2010

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATENT@PARK-LAW.COM

<b>Office Action Summary</b>	<b>Application No.</b> 10/557,820	<b>Applicant(s)</b> HAN ET AL.	
	<b>Examiner</b> TONY TRAN	<b>Art Unit</b> 2894	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 January 2010.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

**DETAILED ACTION**  
**REOPEN PROSECUTION**

1. In view of the Pre-Appeal Brief conference filed on 03/09/10 PROSECUTION IS HEREBY REOPENED. New grounds of rejection are set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below:

/K. D. N./

Supervisory Patent Examiner, Art Unit 2894.

**Claim Rejections - 35 USC § 102**

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this office action:

A person shall be entitled to a patent unless —

(b) The invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States.

3. **Claims 1, 3, and 4** rejected under 35 U.S.C. 102(b) as being anticipated by Takahashi et al. (Patent No.: 4126882) (hereinafter Takahashi).

Regarding **Claim 1**, Takahashi, Second Embodiment, FIGS. 3A-3B teaches a high power light emitting diode package comprising:

an insulation main body (transparent epoxy resin 117, [0083]) having an opening to a bottom surface (an opening of 117 which is occupied by 116a & 116b);

at least two lead terminals (114a & 114b) fixed to the main body (117); and

at least two heat sinks of electrically and thermally conductive metallic materials (116a & 116b, note that as it is specifically said in paragraph [0084] " Since the two light-emitting elements 112a, 112b are mounted on the separate leads 116a, 116b, the LED lamp 121 is superior in heat-sinking performance", therefore, [116a & 116b] are functioning as the heat sinks), the heat sinks (116a & 116b) being separated from each other and fixed to the main body (117), wherein a lower portion (the bottom half portion of 116a & 116b) of each of the at least two heat sinks (116a & 116b) is exposed to the outside of the bottom surface of the main body (117) through the opening of the main body (an opening of 117 which is occupied by 116a & 116b).

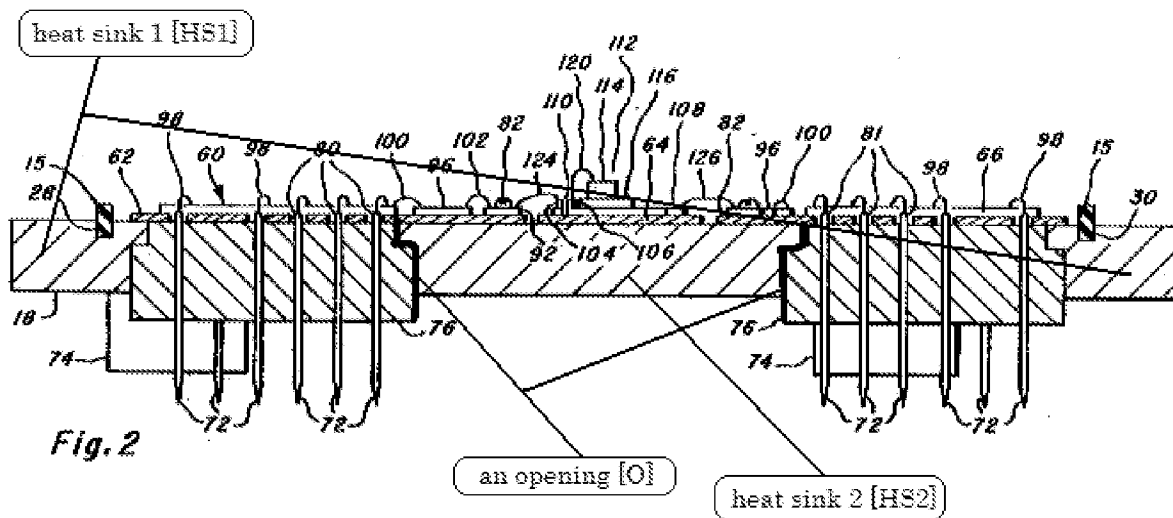
Regarding **Claim 3**, Takahashi, Second Embodiment, FIGS. 3A-3B further teaches the package of claim 1, wherein the at least two heat sinks are a pair (116a & 116b).

Regarding **Claim 4**, Takahashi, Second Embodiment, FIGS. 3A-3B further teaches the package of claim 3, further comprising: at least one light emitting diode die (112a+113a+112b+113b) mounted on upper surfaces of the at least two heat sinks (116a & 116b), the die (112a+113a+112b+113b) being directly and electrically connected to the heat

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sinks through a surface of the die (note that all [113a, 113b, 116a & 116b] are conductive material).

4. **Claims 1-5 and 16-18** rejected under 35 U.S.C. 102(b) as being anticipated by Carson et al. (Patent No.: 4126882) (hereinafter Carson).



Regarding **Claim 1**, Carson teaches a high power light emitting diode package (electro-optical device, col. 1, lines 5-10) comprising:

an insulation main body (76, Fig. 2, note that [76] is made of electrically insulating material, such as glass filled diallyl phthalate, col. 3, lines 32-36) having an opening to a bottom surface ([O], Fig. 2 [as shown above]);

at least two lead terminals (72, col. 3, lines 23-26) fixed to the main body (76); and

at least two heat sinks ([HS1] & [HS2], note that as shown in Fig. 2, even though ([HS1] & [HS2]) is coming from [18], they are distinctly separated by the main body [76], therefore, they are considered as the two heat sinks) of electrically and thermally conductive metallic materials (([HS1] & [HS2])/[18], note that as it specifically said in col. 2,

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lines 65-67 that [18] is made of aluminum to provide a heat-sink), the heat sinks being separated from each other (by 76 as shown in Fig.2 above) and fixed to the main body (76), wherein a lower portion (bottom portion) of each of the at least two heat sinks ([HS1] & [HS2]) is exposed to the outside of the bottom surface of the main body (76) through the opening of the main body ([O]).

Regarding **Claim 2**, Carson further teaches the package of claim 1, wherein each of the at least two heat sinks ([HS1] & [HS2]) has a reflective surface extended from an upper surface thereof (note that aluminum material had a reflective surface, col. 2, lines 65-67).

Regarding **Claim 3**, Carson further teaches the package of claim 1, wherein the at least two heat sinks are a pair ([HS1] & [HS2]).

Regarding **Claim 4**, Carson further teaches the package of claim 3, further comprising: at least one light emitting diode die (114, mounted on upper surfaces of the at least two heat sinks ([HS1] & [HS2]), the die being directly and electrically connected to the heat sinks through a surface of the die (note that substrate segment 62, 64 & 66 are made of alumina, die 114 is electrically connected to [62, 64 & 66], therefore, 114 being directly and electrically connected to ([HS1] & [HS2])).

Regarding **Claim 5**, Carson further teaches the package of claim 4, further comprising: bonding wires (98, col. 4, lines 15-20) electrically connecting the at least two lead terminals (72), the at least two heat sinks ([HS1] & [HS2]) and the at least one light emitting diode die (114).

Regarding **Claim 16**, Carson, Fig. 2 teaches a high power light emitting diode package comprising:

an insulation main body (76);

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at least two lead terminals (72) fixed to the main body (76);

at least two heat sinks ([HS1] & [HS2], note that as shown in Fig. 2, even though ([HS1] & [HS2]) is coming from [18], they are distinctly separated by the main body [76], therefore, they are considered as the two heat sink) of electrically and thermally conductive materials (aluminum), the heat sinks being separated from each other ([HS1] & [HS2]) and fixed to the main body (76), each of the at least two heat sinks ([HS1] & [HS2]) having an upper surface ([US], Fig. 2 [as shown above]) and a lower surface [LS], the lower surface [LS] of each of the at least two heat sinks ([HS1] & [HS2]) being relatively wider ([W2] > [W1] in vertical direction, note that Applicant did not claim which direction of the width) than the upper surface [US] of each of the at least two heat sinks ([HS1] & [HS2]); and

a light emitting diode die (114) mounted on one of the upper surfaces [US] of the heat sinks ([HS2]), the light emitting diode die (114) having a lower surface facing the upper surface of each of the at least two heat sinks ([HS1] & [HS2]),

wherein the upper surface [US] of each of the at least two heat sinks ([HS1] & [HS2]) is wider than the lower surface (bottom surface) of the light emitting diode die (114), so that the light emitting diode die (114) mounted partly (only small portion) on a portion of the heat sink ([HS2]).

Regarding **Claim 17**, Carson further teaches the package of claim 1, wherein the at least two heat sinks each consist of either copper, gold, silver, or aluminum (note that [18] is made of aluminum, col. 2, lines 65-67).

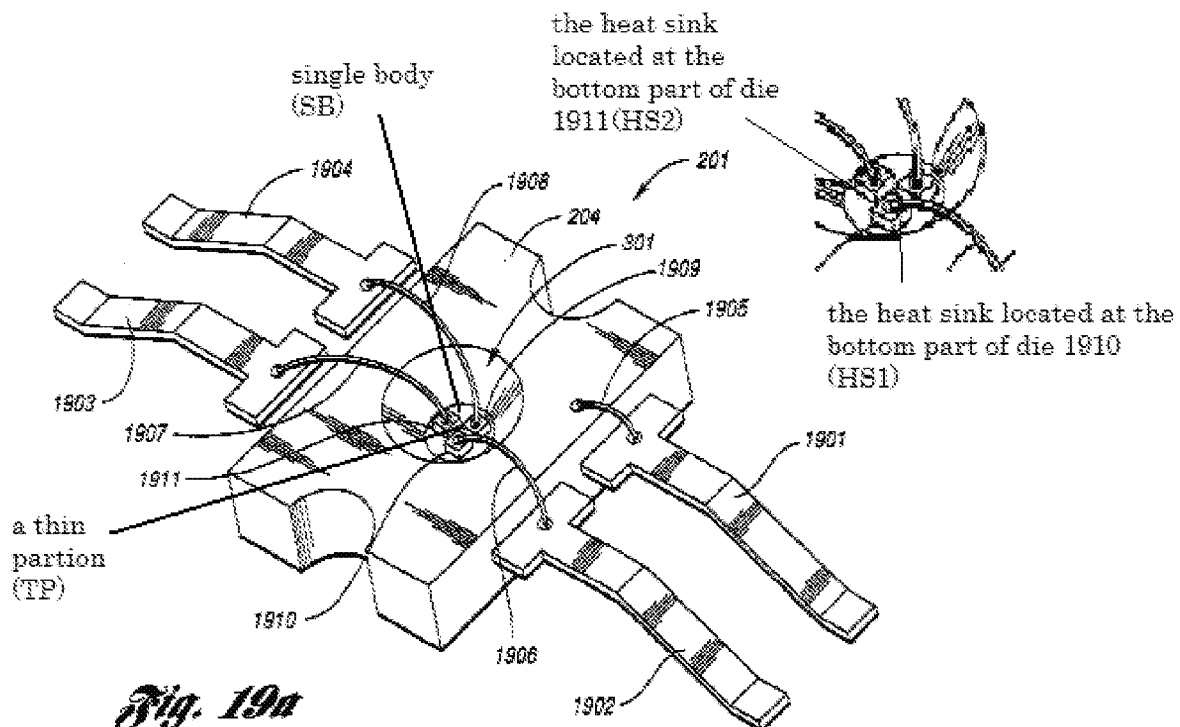
Regarding **Claim 18**, Carson further teaches the package of claim 16, wherein the at least two heat sinks each consist of either copper, gold, silver, or aluminum (note that [18] is made of aluminum, col. 2, lines 65-67).

### Claim Rejections - 35 USC § 103

#### 5. 35 U.S.C. 103 Conditions for patentability; non-obvious subject matter.

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-10, 12-13, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts et al. (Patent No.: US 6335548 B1) (hereinafter Roberts) in view of Carson et al. (Patent No.: 4126882) (hereinafter Carson).



Regarding Claim 1, Roberts, one embodiment, FIGS. 19A-19B teaches a high power



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light emitting diode package comprising:

a insulation main body (204, col. 29, lines 61-65, note that could be an alternatively of another high thermal conductivity material such as ceramic, col. 10, lines 1-6);

at least two lead terminals (1902 & 1903, col. 30, lines 5-10) fixed to the main body (204); and

at least two heat sinks (HS1 & HS2, FIG. 19a [as shown above], note that HS1 and HS2 are sitting on top of heat extraction 204 which are conducting heat to 204 therefore they are considering as the heat sinks) of electrically and thermally conductive materials, the heat sinks being separated from each other and fixed to the main body (204).

However, Roberts, one embodiment, FIGS. 19A-19B does not disclose a heat sink of electrically and thermally conductive metallic materials

Nevertheless, Roberts, one embodiment, FIGS 5-6 does teach a heat sink of electrically and thermally conductive metallic materials (502, col. 16, lines 30-67)

Therefore, since Roberts, one embodiment, FIGS. 19A-19B and Roberts, one embodiment, FIGS 5-6 teach on the same endeavor. It would have been obvious to one ordinary skill in the art at the time the invention was made to further including a heat sink of electrically and thermally conductive metallic materials in Roberts, one embodiment, FIGS. 19A-19B, as taught by Roberts, one embodiment, FIGS 5-6. One would have been motivate to make such a change to improve electrical characteristic and performance of light emitting device (Roberts, BACKGROUND ART).

Furthermore, after the combining of Roberts, one embodiment, FIGS. 19A-19B and Roberts, one embodiment, FIGS 5-6 would teach at least two heat sinks of electrically and thermally conductive metallic materials.

However, Roberts et al., one embodiment, FIGS. 19A-B does not disclose wherein a lower portion of each of the at least two heat sinks is exposed to the outside of the bottom surface of the main body through the opening of the main body.

Nevertheless, Carson, Fig. 2 teaches wherein a lower portion of each of the at least two heat sinks ([HS1] & [HS2]) is exposed to the outside of the bottom surface of the main body (76) through the opening of the main body ([O], Fig. 2 [as shown above]).

Therefore, since Roberts, one embodiment, FIGS. 19A-B and Carson, Fig. 2 teach on the light emitting device. It would have been obvious to one ordinary skill in the art at the time the invention was made to further including wherein a lower portion of each of the at least two heat sinks is exposed to the outside of the bottom surface of the main body through the opening of the main body in (Roberts et al., one embodiment, FIGS. 19A-B) for the purpose of improving the heat dissipation for light emitting diode, as taught by (Carson, Fig. 2). One would have been motivate to make such a change to generate the claimed invention with a reasonable expectation of success and yield predictable results.

Regarding **Claims 2-3**, Roberts, one embodiment, FIGS. 19A-19B further teaches the package of claim 1, wherein each of the at least two heat sinks (HS1 & HS2) has a reflective surface (301, col. 30, lines 9-11 & col. 12, lines 10-15) extended from an upper surface thereof (claim 2).

wherein the at least two heat sinks are a pair (HS1 & HS2, FIG. 19a as shown above) (claim 3).

Regarding **Claim 4**, Roberts, one embodiment, FIGS. 19A-19B further teaches the package of claim 3, further comprising: at least one light emitting diode die (top part of die 1910 or 1911) mounted on upper surfaces of the at least two heat sinks (HS1 & HS2), the

die (1910 & 1911) being directly and electrically connected to the heat sinks (HS1 & HS2) through a surface of the die (top surface of 1910 & 1911).

Regarding **Claim 5**, Roberts, one embodiment, FIGS. 19A-19B further teaches the package of claim 4, further comprising: bonding wires (1906 & 1907) electrically connecting the at least two lead terminals (1902 & 1903), the at least two heat sinks (HS1 & HS2) and the at least one light emitting diode die (1910 & 1911).

Regarding **Claim 6**, Roberts, one embodiment, FIGS. 19A-19B further teaches package of claim 4, further comprising: a lens (401, col. 30, lines 9-10) attached to the main body (204), the lens (401) enclosing the at least one light emitting diode die (1910 & 1911).

Regarding **Claim 7**, Roberts, one embodiment, FIGS. 19A-B and Carson, Fig. 2 disclose all the limitation of claim 6 and Roberts, one embodiment, FIGS. 19A-B further discloses wherein the lens (401) includes at least one light emitting diode die (1910).

Additionally, Roberts, one embodiment, FIGS. 19A-B and Carson, Fig. 2 do not disclose includes an optically transparent material which is directly contacted with the at least one light emitting diode die.

Nevertheless, Roberts, another embodiment, FIGS. 1-15 does teach includes an optically transparent material (501, FIG. 5, col. 17, lines 48-50) which is directly contacted with the at least one light emitting diode die (1910).

Therefore, since Roberts, one embodiment, FIGS. 19A-B, Carson, Fig. 2 and Roberts, another embodiment, FIGS. 1-15 teach on the same light emitting device. It would have been obvious to one ordinary skill in the art at the time the invention was made to further including includes an optically transparent material which is directly contacted with the at least one light emitting diode die in (Roberts, one embodiment, FIGS. 19A-B and Carson,

Fig. 2), for the purpose of enhancing the light transmission as taught by (Roberts et al., another embodiment, FIGS. 1-15). One would have been motivated to make such a change to to generate the claimed invention with a reasonable expectation of success and yield predictable results.

Regarding **Claim 8**, Roberts et al., one embodiment, FIGS. 19A-B further teaches the package of claim 4, further comprising: a fluorescent material converting the wavelength of light emitted from the at least one light emitting diode die (fluorescent dyes....within the encapsulant....re-emit it at lower wavelength, col. 24, lines 39-45, note that the encapsulant is the 203, FIG. 19B, col. 30, lines 8-10).

Regarding **Claim 9**, Roberts et al., one embodiment, FIGS. 19A-B further teaches he package of claim 1, further comprising:

light emitting diode dies (top surface of 1910 & 1911) mounted on the respective heat sinks (HS1 & HS2), the light emitting diode dies emitting different wavelengths of light (the three dies 1909, 1910 and 1911 emit at red, blue, and green wavelengths respectively, col. 30, lines 13-14).

Regarding **Claim 10**, Roberts et al., one embodiment, FIGS. 19A-B further teaches the package of claim 9, wherein the at least two lead terminals (1902 & 1903) include:

lead terminals (1902 & 1903) electrically (connected to the at least two heat sinks (HS1 & HS2) respectively; and a common lead terminal electrically connected to all of the at least two heat sinks (the base (cathode) of the dies, the cup 301 and 204, col. 29, lines 61-67 and col. 30, lines 1-11, FIG. 9a).

Regarding **Claim 12**, Roberts et al., one embodiment, FIGS. 19A-B further teaches the package of claim 9, wherein the light emitting diode dies include light emitting diode

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dies (1909, 1910, and 1911) emitting a first wavelength of light (red), a second wavelength of light (blue) and a third wavelength of light (green), respectively.

Regarding **Claim 13**, Roberts et al., one embodiment, FIGS. 19A-B further teaches wherein the first wavelength, the second wavelength and the third wavelength are red wavelength, green wavelength and blue wavelength, respectively (the three dies 1909, 1910 and 1911 emit at red, blue, and green wavelengths respectively, col. 30, lines 13-14).

Regarding **Claim 15**, the combining of Roberts et al., one embodiment, FIGS. 19A-B further teaches the package of claim 1, further comprising at least one septum (TP, Fig. 19a [as shown above]) formed in a single body (SB) along with the main body (204) to separate the at least two heat sinks (HS1 & HS2).

7. **Claims 11 and 14** are rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts et al. (Patent No.: US 6335548 B1) (hereinafter Roberts) in view of Carson et al. (Patent No.: 4126882) (hereinafter Carson) and further in view of Pederson (Patent No.: US 6590343 B2).

Regarding **Claim 11 and 14**, Roberts and Carson disclose all the limitation of 10.

Moreover, Roberts, one embodiment, FIGS. 19A-B further does not disclose the limitation as claims 11 and 14.

Nevertheless, Pederson does teach an additional heat sink (346, FIG. 18, col. 14, lines 45-50); and a zener diode (614, FIG. 24, col. 18, lines 60-65) mounted on the additional heat sink (note that the zener diode is mounted on one of the opening 344, FIG. 18) (claim 11), and

a controller (50, FIG. 26, col. 12, lines 10-20) for controlling the electric power supplied to the light emitting diode package (608, 610, 612), wherein the controller controls the amount of the current supplied to the respective heat sinks (microcontroller 900 switches to decrease the current, see the ABSTRACT) (claim 14).

Therefore, it would have been obvious to one ordinary skill in the art at the time the invention was made to include all the limitation in claims 11 and 14, as taught by Pederson. One would have been motivate to make such a change to optimize the performance of the LED (Pederson, col. 1, lines 10-30), and inclusion of such would improve the photometric efficiency.

#### **Response to Arguments**

8. Applicant's arguments with respect to claims 1-18 on the remarks filed on Pre-Brief Conference request filed on 01/27/10 have been considered but are moot in view of the new ground(s) of rejection.

#### **CONCLUSION**

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to TONY TRAN whose telephone number is (571)270-1749. The examiner can normally be reached on Monday through Friday: 7:30AM-5:00PM (E.S.T.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kimberly Nguyen can be reached on (571) 272-2402. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tony Tran/  
Examiner, Art Unit 2894

/Kimberly D Nguyen/  
Supervisory Patent Examiner, Art  
Unit 2894